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Test Questions

(hint: print questions & mark answers before starting online test)

### Chapter 1

1. Candidate who wishes to obtain a certification in computed tomography (CT) must hold a registration in which one of the following supporting categories?

- A. Radiography
- B. Nuclear Medicine Technology
- C. Radiation Therapy
- D. Any one of the above

2. Minimum of how many hours of structured education credits required in topics that reflect the CT certification examination content?

- A. 16
- B. 24
- C. 32
- D. 60

3. The American Registry of Radiologic Technologists (ARRT) post-primary examination in CT was first offered in March \_\_\_\_\_.

- A. 1970
- B. 1985
- C. 1995
- D. 2007

### Chapter 2

4. Proper documentation of which of the following can greatly assist the interpreting physician in the diagnostic process of a patient?

- A. patient's recent procedures, surgeries, and symptoms
- B. possible trauma in patient
- C. specific areas of pain or discomfort in patient
- D. all of the above

5. Communication is the key to any successful patient interaction.

- A. TRUE
- B. FALSE

6. Which of the following high-density or metallic items should be removed from a patient when necessary and appropriate during CT scanning?

- A. jewelry
- B. hair fasteners
- C. electronic devices
- D. all of the above

7. A \_\_\_\_\_ must sign the informed consent form for a minor.

- A. technologist
- B. parent or legal guardian
- C. radiologist
- D. nurse

8. Which of the following can cause substantial image degradation during CT examination?

- A. contrast injection
- B. patient motion

- C. gantry/table
- D. none of the above

9. Which of the following are considered as vital signs?

- A. temperature
- B. pulse & blood pressure
- C. respirations
- D. all of the above

10. Systolic blood pressure indicates the pressure within arteries during cardiac contraction and should be less than \_\_\_\_\_ mm Hg.

- A. 120
- B. 90
- C. 85
- D. 70

11. A \_\_\_\_\_ is an electronic device used to measure pulse and respiratory status.

- A. ionization chamber
- B. otoscope
- C. pulse oximeter
- D. chest x-ray

12. Which of the following is a graphic representation of the electrical activity of the heart?

- A. H & D curve
- B. An electrocardiogram (ECG)
- C. The cardiac cycle
- D. Mammogram

13. The cardiac cycle can be divided into which of the following distinct stages?

- A. Atrial systole
- B. Ventricular systole
- C. Complete cardiac diastole
- D. all of the above

14. \_\_\_\_\_ refers to an insufficient oxygenation of tissue at the cellular level.

- A. Hypoxia
- B. Asthma
- C. Epilation
- D. Migraine

15. Oxygen is considered a drug, and it is typically administered under the order of a physician.

- A. TRUE
- B. FALSE

16. A \_\_\_\_\_ can be used to drain fluid from the intrapleural space of the ill or injured patient.

- A. pulse oximeter
- B. otoscope
- C. thoracostomy tube (chest tube)
- D. naso-gastric tube

17. CT technologist must take care to ensure that the urine drainage bag be kept below the patient's bladder at all times to prevent the \_\_\_\_\_ of urine when imaging a patient with an in-dwelling catheter.

- A. darkening
- B. clotting

- C. back-flow (reflux)
- D. none of the above

18. Blood urea nitrogen (BUN) and creatinine level are lab values used to indicate \_\_\_\_\_.

- A. cardiac function
- B. renal function
- C. lung function
- D. thyroid function

19. \_\_\_\_\_ medications may be prescribed to reduce patient anxiety during a CT examination.

- A. Anxiolytic
- B. Asthma
- C. Antihistamine
- D. Diuretic

20. Which of the following radiopaque contrast media (RCM) is typically used for CT examinations?

- A. iodine
- B. barium
- C. gadolinium
- D. both A and B

21. Which of the following can be used as negative contrast agents during CT examination?

- A. air
- B. gases
- C. water
- D. all of the above

22. Which of the following are contraindications to IV iodinated contrast agents?

- A. Allergy to iodine
- B. History of allergic reaction to an iodinated contrast agent
- C. Renal insufficiency or failure
- D. all of the above

23. Intravascular RCM are generally administered in doses ranging from \_\_\_\_\_ ml.

- A. 1 to 10
- B. 10 to 20
- C. 20 to 35
- D. 50 to 150

### Chapter 3

24. \_\_\_\_\_ is defined as the reduction of intensity of a radiation beam as it passes through a substance.

- A. Scattered radiation
- B. Pair production
- C. Attenuation
- D. Radio activity

25. Overall, an attenuation of the CT x-ray beam depends on which of the following factors?

- A. beam quality (photon energy)
- B. atomic density of the imaged tissue
- C. magnet size
- D. both A and B

26. The focus-to-detector distance is the distance between the x-ray source (CT tube) and \_\_\_\_\_.

- A. CT table
- B. detector array
- C. control booth
- D. power injector

27. The spatial arrangement of CT detector elements, including the amount of inter-space material required between adjacent elements is called \_\_\_\_\_.

- A. window width
- B. 3D reconstruction
- C. geometric efficiency of a detector array
- D. minification

28. An overbeaming in Computed Tomography is known as \_\_\_\_\_ process.

- A. penumbra
- B. subtraction
- C. 3D
- D. windowing

29. Radiation protection in CT should follow which of the following concept?

- A. ALARA (as low as reasonably achievable)
- B. Inverse square law
- C. Planck's constant
- D. none of the above

30. Which of the following general radiation protection principles should apply in CT?

- A. Strict clinical indication
- B. Protocol optimization
- C. Shielding
- D. all of the above

31. During CT data acquisition, the section of the patient exposed to radiation may be referred to as the \_\_\_\_\_.

- A. lab results
- B. dose profile
- C. insurance data
- D. patient profile

32. Image noise is directly related to \_\_\_\_\_.

- A. window width
- B. 3D reconstruction
- C. patient size
- D. contrast media

33. To maximize dose reduction, lead shielding must be applied both above and below the patient to account for the rotational nature of the exposure in CT.

- A. TRUE
- B. FALSE

34. \_\_\_\_\_ describes the amount of radiation absorbed in a quantity of air.

- A. Magnification
- B. Air kerma
- C. Ionization
- D. Attenuation

35. \_\_\_\_\_ is an approximate measure of the dose received in a single CT section or a slice.
- A. window width
  - B. 3D reconstruction
  - C. CT dose index (CTDI)
  - D. flux gain
36. Which of the following are current industry standards requirements apply to CT systems for dose reduction techniques?
- A. Automated CT dose check & AEC
  - B. Adult and pediatric reference protocols
  - C. DICOM Radiation Dose Structured Reporting
  - D. all of the above
37. Which of the following are recommendations for the reduction of pediatric dose in CT?
- A. Elimination of CT scans for inappropriate indication
  - B. Reduction of multi-phase scanning, mA & kVp
  - C. Increasing pitch
  - D. all of the above
38. \_\_\_\_\_ was developed by the Alliance for Radiation Safety in Pediatric Imaging and sponsored by the Society for Pediatric Radiology.
- A. Image Gently campaign
  - B. Inverse square law
  - C. Magnetic safety law
  - D. ALARA (as low as reasonably achievable)

#### **Chapter 4**

39. Axial plane computed tomography (CT) images for brain are acquired parallel to \_\_\_\_\_ on a scout image.
- A. pubic symphysis
  - B. infraorbital-meatal line (IOML)
  - C. sternal notch
  - D. diaphragm
40. During brain axial CT thinner sections through the posterior fossa reduce the beam-hardening artifact caused by the \_\_\_\_\_.
- A. fourth ventricle
  - B. basilar artery
  - C. petrous pyramids
  - D. pituitary gland
41. Non-contrast CT examinations of the brain are routinely indicated for \_\_\_\_\_ to diagnose intracranial hemorrhage or hematoma.
- A. tumors
  - B. aneurysms
  - C. trauma
  - D. sinusitis
42. \_\_\_\_\_ must be first excluded on the noncontrast images obtained before thrombolytic therapy for acute stroke.
- A. Hemorrhage
  - B. Necrosis
  - C. Aneurysm
  - D. Calcification

43. Unless contraindicated, intravenous (IV) administration of an iodinated contrast agent is essential in cases of arteriovenous malformation, suspected neoplasm, or attention to the pituitary gland.
- A. True
  - B. False
44. CT exams of the temporal bones and internal auditory canal require a high-resolution imaging technique that contains which of the following?
- A. Thin slices
  - B. Small targeted display field of view (DFOV)
  - C. High-resolution reconstruction algorithm
  - D. all of the above
45. MDCT axial acquisitions allow for isotropic MPR, which can eliminate the added patient radiation dose from direct coronal acquisition.
- A. True
  - B. False
46. CT examinations of the sinuses should include axial images parallel to the \_\_\_\_\_.
- A. occipital bone
  - B. hard palate
  - C. foramen lacerum
  - D. none of the above
47. Direct coronal imaging perpendicular to the axial plane may be obtained with the patient in \_\_\_\_\_ position for CT sinus exams.
- A. prone
  - B. oblique
  - C. sitting
  - D. semi-erect
48. Which of the following are indications for head CT exam with contrast media?
- A. Neoplasm
  - B. Inflammatory processes
  - C. Vascular abnormalities
  - D. all of the above
49. Brain CT angiography (CTA) consists of advanced multidimensional CT imaging of the \_\_\_\_\_.
- A. maxillary sinuses
  - B. ethmoid cells
  - C. cranial blood vessels (circle of Willis)
  - D. nasopharynx
50. \_\_\_\_\_ refers to the level of blood flow throughout brain tissue.
- A. Migraine
  - B. Cerebral perfusion
  - C. Stroke
  - D. Parkinson's
51. The comprehensive MDCT management of acute stroke consists of which of the following?
- A. Precontrast head CT
  - B. CTA of the brain and carotid arteries
  - C. CT perfusion (CTP) imaging

D. all of the above

52. Xenon CT perfusion (Xe-CT) for brain is performed with the inhalation administration of a nonradioactive isotope of \_\_\_\_\_.

- A. xenon (Xe) gas
- B. helium
- C. oxygen
- D. carbon dioxide

53. Helical axial plane CT images of the soft tissue of the neck are obtained from the superior orbital rim inferiorly through the \_\_\_\_\_.

- A. C5
- B. Mid-sternum
- C. lung apex
- D. diaphragm

54. Slice thickness of \_\_\_\_\_ mm is adequate for most CT studies of the neck soft tissue.

- A. .5 to .75
- B. 1 to 1.5
- C. 3 to 5
- D. 10 to 15

55. Image quality degradation resulting from \_\_\_\_\_ is a primary concern during CT examinations of the soft tissue of the neck.

- A. scattered radiation
- B. motion
- C. detectors
- D. 3D software

56. Which of the following looks hyper-dense on CT because of its inherent iodine content?

- A. salivary gland
- B. pituitary gland
- C. adrenal gland
- D. thyroid gland

57. \_\_\_\_\_ is one of the key attributes of helical MDCT in chest imaging.

- A. Reduced patient dose
- B. Reduced scattered radiation
- C. Speed
- D. Reduced occupational dose

58. During chest CT exam, patient is positioned supine with the arms brought above the head to reduce artifact from the \_\_\_\_\_ area.

- A. shoulder
- B. neck
- C. abdominal
- D. pelvic

59. What is kVp setting for CT chest exam with automatically modulated exposure?

- A. 10 to 25
- B. 30 to 50
- C. 50 to 75
- D. 80 to 120

60. Which of the following are indications for contrast media administration in CT chest exam?  
A. Evaluation of the mediastinum and/or major vessels  
B. Hilar or pleural abnormalities  
C. Assessment of lymphadenopathy  
D. all of the above
61. High-resolution CT (HRCT) is used for chest exam to demonstrate diffuse lung disease.  
A. True                      B. False
62. HRCT of the lung incorporates which of the following technical parameters to maximize resolution?  
A. Axially acquired thin slices (0.6 to 2 mm)  
B. Reconstruction with a high spatial frequency algorithm  
C. Reduced (targeted) DFOV to include only the lung parenchyma  
D. all of the above
63. \_\_\_\_\_ occurs when a blood clot breaks free from elsewhere in the venous system and migrates into a pulmonary artery.  
A. Migraine  
B. Pulmonary embolism  
C. Asthma  
D. Bronchitis
64. A \_\_\_\_\_ refers to a large clot that straddles the main trunk of the pulmonary artery as it bifurcates into the left and right pulmonary arteries.  
A. pulmonary edema  
B. pneumothorax  
C. saddle pulmonary embolus  
D. atelectasis
65. An injection of saline immediately after administration of the contrast agent bolus can decrease enhancement within the pulmonary vessels.  
A. True                      B. False
66. Cardiac CT covers which of the following clinical applications?  
A. Coronary artery calcium (CAC) quantitation  
B. Coronary CTA (CCTA)  
C. Non-coronary cardiac imaging  
D. all of the above
67. The primary clinical indication for MDCT CAC quantitation is the assessment of \_\_\_\_\_.  
A. atherosclerotic disease  
B. congenital heart disease  
C. cardiomyopathy  
D. none of the above
68. The major controlling factor of CCTA is the patient's heart rate.  
A. True                      B. False
69. \_\_\_\_\_ is a primary diagnostic tool in the evaluation of aortic aneurysm.  
A. Sonography  
B. Digital radiography  
C. MDCT angiography  
D. Nuclear medicine



70. CT bronchography is a 3-D CT and can be used to visualize \_\_\_\_\_.  
A. ribs  
B. cervical spine  
C. tracheobronchial tree  
D. kidneys
71. The CT exam of the abdomen begins just above the \_\_\_\_ and extends through the aortic bifurcation at the general area of the iliac crest.  
A. clavicle  
B. lung apex  
C. diaphragm  
D. kidneys
72. For general studies of the abdomen and pelvis, \_\_\_\_ ml of oral contrast agent is administered 30 to 120 minutes prior to the exam.  
A. 30 to 150  
B. 750 to 1500  
C. 2000 to 2500  
D. 3000 to 4300
73. The relationship among table travel speed, detector collimation, and pitch is important in determining the amount of data gathered per gantry rotation and the overall scan time.  
A. True  
B. False
74. Which of the following algorithm is used for reconstruction in abdomen CT examination?  
A. bone window  
B. subtraction method  
C. standard soft tissue  
D. none of the above
75. Which of the following is benign neoplasms of the liver?  
A. Hemangioma  
B. Focal nodular hyperplasia  
C. Hepatic cysts  
D. all of the above
76. The \_\_\_\_\_ is the second most commonly injured abdominal organ (after the spleen) during trauma.  
A. liver  
B. kidneys  
C. bladder  
D. pubic symphysis
77. The ability of CT to demonstrate gallstones depends primarily on the \_\_\_\_\_.  
A. stone size  
B. stone composition  
C. number of stones  
D. patient's age
78. Which of the following are components of the biliary tract commonly demonstrated on CT exam?  
A. Common hepatic duct  
B. Common bile duct  
C. Intrahepatic bile ducts  
D. all of the above

79. Which of the following are typical signs of traumatic splenic injury?

- A. Hematoma
- B. Hemorrhage
- C. Laceration
- D. all of the above

80. \_\_\_\_\_ is the most common pancreatic neoplasm.

- A. Pseudocysts
- B. Lymphoma
- C. Adenocarcinoma
- D. None of the above

81. Water as an oral contrast agent to distend the proximal GI tract without the streaking artifact possible when positive contrast media are used.

- A. True
- B. False

82. \_\_\_\_\_ is the primary imaging modality for the evaluation of the adrenal glands.

- A. Nuclear Medicine
- B. Radiography
- C. Computed Tomography
- D. Sonography

83. During routine abdominal CT scanning, the adrenal glands are usually adequately imaged with slice thicknesses in the \_\_\_\_\_ range.

- A. 1- to 2-mm
- B. 3- to 5-mm
- C. 7- to 9-mm
- D. 10- to 15-mm

84. The urinary tract is consisted of which of the following?

- A. kidneys
- B. ureters
- C. bladder
- D. all of the above

85. A CT urogram (CT intravenous pyelogram [IVP]) is a comprehensive, multiphasic evaluation of the \_\_\_\_\_.

- A. urinary tract
- B. reproductive organs
- C. digestive system
- D. femoral artery

86. Which of the following are parts of the gastrointestinal tract?

- A. esophagus
- B. stomach
- C. small and large intestines
- D. all of the above

87. Puncture in the wall of the GI tract is called \_\_\_\_\_.

- A. perforation
- B. fistula
- C. abscess

D. infection

88. The acquisition speed of MDCT effectively eliminates peristaltic motion artifact and greatly improves the CT evaluation of intestinal wall pathology.

- A. True
- B. False

89. CT exam of the abdomen and/or pelvis is performed predominantly with the patient in the \_\_\_\_\_ position.

- A. oblique
- B. sitting
- C. supine
- D. tilted

90. A protrusion of the gastroesophageal junction through the diaphragm into the thorax is called \_\_\_\_\_.

- A. esophageal varices
- B. esophagitis
- C. hiatal hernia
- D. acid reflux

91. The \_\_\_\_\_ is divided proximally to distally as the duodenum, jejunum, and ileum.

- A. large intestine
- B. small intestine
- C. thorax
- D. liver

92. Which of the following helps identify the large intestine on CT cross-sectional images?

- A. anatomic location
- B. haustral markings
- C. presence of fecal matter
- D. all of the above

93. For large intestine CT exam, oral contrast agents should be administered in sufficient volume (>750 ml) and at least \_\_\_\_\_ minutes before scanning.

- A. 5
- B. 10
- C. 25
- D. 90

94. A \_\_\_\_\_ of the testes is an abnormal accumulation of fluid around a testicle.

- A. hydrocele
- B. Benign prostate hyperplasia (BPH)
- C. enterovesical fistula
- D. appendicolith

95. The uterine wall in female is divided into which of the following parts?

- A. Perimetrium
- B. Myometrium
- C. Endometrium
- D. all of the above

96. CT colonography is a primarily screening MDCT examination of the large intestine with the main goal to identify \_\_\_\_\_.

- A. esophageal varices
- B. esophagitis
- C. adenomatous polyps
- D. acid reflux

97. \_\_\_\_\_ is a specialized CT examination of the bladder in which an iodinated contrast media is directly administered under gravity into the bladder via Foley catheter.

- A. Myelography
- B. CT cystography
- C. Colonoscopy
- D. Discography

98. Which of the following imaging modality is the primary choice for trauma patients mainly because of its superior speed?

- A. Nuclear Medicine
- B. Radiography
- C. Computed Tomography
- D. Sonography

99. The spinal cord extends inferiorly from the brain's medulla and ends at approximately the level of \_\_\_\_\_.

- A. C7
- B. T5
- C. T7
- D. T12 to L1

100. CT of the musculoskeletal system is used to identify and characterize bony neoplasms such as cysts, benign and malignant tumors, and metastatic deposits.

- A. True
- B. False

101. Which of the following position allows the hand, wrist, forearm, and elbow to be scanned without superimposition with the patient's head and trunk during CT exam?

- A. decubitus
- B. superman
- C. oblique
- D. sitting

102. \_\_\_\_\_ improves visualization of the spinal cord, nerve roots, and surrounding soft tissue structures during a CT myelogram.

- A. Saline drip
- B. Barium sulfate
- C. Intrathecal administration of a contrast
- D. Air

103. CT provides precise localization for which of the following interventional procedures?

- A. percutaneous biopsy
- B. abscess drainage
- C. radiofrequency ablation
- D. all of the above

104. Which of the following is a disadvantage of CT fluoroscopy for both patient and staff?

- A. added radiation dose
- B. higher workload
- C. time

D. scheduling

105. \_\_\_\_\_ is a functional nuclear medicine study utilizing fludeoxyglucose F 18 (FDG) as a radiopharmaceutical.

- A. Radiography
- B. Ultrasound
- C. MRI
- D. Positron emission tomography (PET)

### Chapter 5

106. The general process of CT imaging can be divided into which of the following steps?

- A. Data acquisition & reconstruction
- B. Multidimensional image display
- C. Image archival and communication
- D. all of the above

107. \_\_\_\_\_ acquired during a CT examination, is used as a localizer for the prescription of the subsequent cross-sectional CT acquisition(s).

- A. Spot film
- B. Scout image (the initial image)
- C. Last image hold
- D. Dynamic image

108. The CT gantry houses which of the following mechanical components of CT system?

- A. generator & x-ray tube
- B. data acquisition system (DAS)
- C. assorted collimators, slip-rings & detectors
- D. all of the above

109. \_\_\_\_\_ improves the geometric efficiency of the x-ray beam, leading to a greater spatial resolution.

- A. Tube housing
- B. Lead shielding
- C. Smaller focal spot
- D. Ionizing chamber

110. Selection of mA setting in CT depends on which of the following factors?

- A. clinical indication for the CT study
- B. patient size/density
- C. required signal-to-noise ratio (SNR) for adequate examination quality
- D. all of the above

111. \_\_\_\_\_ controls the quality of the x-ray beam and its overall penetrating capabilities.

- A. Peak kilovoltage (kVp)
- B. Milliampere-seconds (mAs)
- C. Time
- D. Shielding

112. The \_\_\_\_ of an x-ray tube is defined as the thickness of material that is capable of reducing the intensity of the x-ray beam to one-half of its original value.

- A. flux gain
- B. half-value layer (HVL)
- C. collimation shutters
- D. cathode

113. The CT x-ray tube contains which of the following \_\_\_\_\_ to improve the energy quality of the x-ray beam.

- A. focusing cup
- B. cathode
- C. inherent and added filtration
- D. large filament

114. Which of the following is the general purpose of beam collimation in CT?

- A. restricting the radiation exposure to the area of interest
- B. reducing patient radiation dose
- C. improving image quality
- D. all of the above

115. Collimation of the beam in MDCT directly affects the volume of tissue measured for each rotation of the tube.

- A. True
- B. False

116. \_\_\_\_\_ describes the relationship between collimation and table movement during scanning.

- A. Gonadal dose
- B. Pitch
- C. Patient radiation dose
- D. None of the above

117. CT collimation for MDCT can be divided into which of the following components?

- A. Beam collimation
- B. Detector (section) collimation
- C. Step-wedge filter
- D. Both A and B

118. Which of the following is responsible for measuring transmitted radiation and converting it into a proportionate electronic signal to be used for image reconstruction?

- A. Tube housing
- B. Anode
- C. CT detector
- D. Ionizing chamber

119. Which of the following are desired qualities of CT detectors?

- A. High efficiency
- B. Rapid signal decay
- C. High dynamic range
- D. all of the above

120. All modern MDCT systems use solid-state detectors, consisting primarily of a scintillating crystal material.

- A. True
- B. False

121. The first generation head-only CT system was developed by \_\_\_\_\_ in 1972 for clinical use.

- A. Nicola Tesla
- B. Godfrey Hounsfield
- C. Wilhelm Conrad Roentgen
- D. Albert Einstein

122. Because of its high-speed capabilities, the primary application of Electron beam CT (EBCT) is \_\_\_\_\_.

- A. extremities scanning
- B. IVPs
- C. cardiac imaging
- D. upper GI imaging

123. \_\_\_\_\_ refers to the number, length, and organization of the individual detector elements in an MDCT system.

- A. Detector configuration
- B. Data acquisition system
- C. Patient table
- D. None of the above

124. Which of the following are general formats of MDCT detector configuration?

- A. Uniform matrix array
- B. Adaptive array
- C. Hybrid array
- D. all of the above

125. \_\_\_\_\_ refers to the electronic combination of signal from adjacent detectors to form a reconstructed slice that is thicker than the individual detector width.

- A. Multiplanar reconstruction (MPR)
- B. Binning
- C. Surface rendering
- D. Minimum intensity projection

126. Which of the following is used for dynamic imaging of physiologic processes such as respiration, swallowing, and cardiac cycle?

- A. PET/CT
- B. Radiation brachytherapy
- C. Cine CT
- D. Doppler ultrasound

127. Which of the following converts the electronic signal from CT detectors into digital form?

- A. analog-to-digital converter (ADC)
- B. signal-to-noise ratio (SNR)
- C. step up transformer
- D. mA meter

128. Pipelining of CT computer systems improves the speed and efficiency of which of the following functions?

- A. detector signal preprocessing
- B. convolution and postprocessing
- C. image manipulation
- D. all of the above

129. The hard disk drive is the common choice for mass storage of CT computer system data.

- A. True
- B. False

130. \_\_\_\_\_ processes the signal data collected from the detectors and conditions it by applying appropriate correction factors for beam hardening and detector malfunction.

- A. Reconstruction software
- B. Preprocessing software
- C. Postprocessing software
- D. 3D software

131. Which of the following controls windowing, image display filters, 3-D/MPR reformation, and analytic functions (ROI, distance) applications in CT?

- A. preprocessing software
- B. postprocessing software
- C. laser printing
- D. communication software

132. The quantity of radiation is controlled primarily by \_\_\_\_\_.

- A. kVp setting
- B. focal spot size
- C. mA selection
- D. step-wedge filter

133. The ability of an object to attenuate the x-ray beam is assigned a value called \_\_\_\_\_.

- A. lethal dose (LD)
- B. absorbed dose
- C. linear attenuation coefficient ( $\mu$ )
- D. gonadal dose

134. The primary goal of CT image reconstruction is to spatially distribute the attenuation data recorded by the detector array.

- A. True
- B. False

135. \_\_\_\_\_ refers to the volumetric data acquisition process whereby the gantry and bed undergo continuous motion.

- A. Conventional CT data acquisition
- B. Helical or spiral scanning
- C. First generation CT system
- D. None of the above

136. The digital CT image is displayed on an arrangement of numerical values called \_\_\_\_\_.

- A. matrix
- B. operating system
- C. pixels
- D. algorithm

137. The Most CT systems use which of the following number pixels contained in a matrix?

- A.  $10 \times 15$
- B.  $30 \times 40$
- C.  $50 \times 100$
- D.  $512 \times 512$

138. What is a CT number for water?

- A. 0
- B. 15
- C. 40
- D. 50



139. Which of the following technical parameters control pixel dimension and voxel volume?

- A. Matrix size
- B. DFOV
- C. Section width (z)
- D. all of the above

140. Less tissue in each voxel reduces the partial volume effect and degrades image quality in CT.

- A. True
- B. False

141. \_\_\_\_\_ is used to describe the process of grayscale mapping of the CT image.

- A. Subtraction ratio
- B. Windowing
- C. Cropping
- D. communication software

142. During display of the CT image, each pixel is assigned a shade of gray on the basis of its \_\_\_\_\_.

- A. lethal dose (LD)
- B. absorbed dose
- C. CT number (HU)
- D. linear attenuation coefficient ( $\mu$ )

143. The most CT imaging systems routinely have the ability to assign up to \_\_\_\_\_ Hounsfield values to any one pixel.

- A. 500 ( $2^{12}$ )
- B. 660 ( $2^{12}$ )
- C. 870 ( $2^{12}$ )
- D. 4096 ( $2^{12}$ )

144. The window width controls the contrast of a CT image, and the window level controls its \_\_\_\_\_.

- A. brightness
- B. size
- C. shape
- D. algorithm

145. Because most CT examinations acquire data in the transverse, or axial plane, the most common orthogonal MPR planes are coronal and sagittal.

- A. True
- B. False

146. Which of the following are quantitative measurements to assess the image quality of a CT system?

- A. Spatial, contrast & temporal resolution
- B. Uniformity & linearity
- C. Noise
- D. all of the above

147. Which of the following increases geometric unsharpness because of penumbra?

- A. subtraction ratio
- B. large focal spot
- C. kVp
- D. mAs

148. \_\_\_\_\_ is the ability of the CT system to detect an object with a small difference in linear attenuation coefficient as compared with the surrounding tissue.

- A. Noise
- B. Contrast resolution
- C. Penumbra
- D. MTF

149. Which of the following noise can effect/degrade the CT image?

- A. Quantum noise
- B. Electronic system noise
- C. Artifact related noise
- D. all of the above

150. As pitch increases, the speed at which the patient travels through the CT gantry decreases.

- A. True
- B. False

151. Which of the following are common manifestations of motion artifact on the CT image?

- A. Streaking
- B. Blurring
- C. Chemical fog
- D. both A and B

152. Web-based teleradiology systems use the geographically unlimited WAN of the World Wide Web to transmit images for physician review.

- A. True
- B. False